**Honors Alg 2 Chapter 6 Assessment Review Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

\_\_\_\_ 1. Which exponential function is shown in the graph below?



|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

**Evaluate the logarithm.**

2. 

3. Evaluate  using a calculator. Round your answer to three decimal places.

**Newton’s Law of Cooling states that for a cooling substance with initial temperature , the temperature *T* after *t* minutes can be modeled by , where  is the surrounding temperature and *r* is the cooling rate of the substance.**

4. How long it will take for a 116°F cup of coffee to cool to a temperature of 86°F when the surrounding temperature is 40°F and the cooling rate of coffee is 0.029? Round your answer to the nearest minute.

**Tell whether the function represents *exponential growth* or *exponential decay*. Then graph the function.**

 5. 

 6. 

**Rewrite the equation in exponential form.**

7. 

8. 

 9. Graph .

10. The value of a home *y* (in thousands of dollars) can be approximated by the model , where *t* is the number of years since 2010.

a. Tell whether the model represents exponential growth or exponential decay.

b. Identify the annual percent increase or decrease in the value of the home.

c. Estimate the year when the value of the home will be $173,000.

11. The time *t* (in years) for the deer population in a local park to reach a certain number *P* can be modeled by .

a. How much time will it take for the deer population to reach 528?

b. Find the inverse of the given function. Describe what the inverse represents.

12. You invest $4100 in an account earning 8% annual interest compounded continuously.

a. Write an exponential function for the amount *A* in the account after *t* years.

b. Find the inverse of the function from part (a). Describe what the inverse represents.

c. You want the investment to double in 7 years. Will you reach your goal? If not, how much more time is needed?

**Honors Alg 2 Chapter 6 Assessment Review**

**Answer Section**

**MULTIPLE CHOICE**

1. ANS: B PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.1

NAT: HSF-IF.C.8b | HSF-LE.A.2 | HSF-LE.B.5 KEY: application | exponential function

NOT: Example 3

2. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.1

NAT: HSF-IF.C.8b | HSF-LE.A.2 | HSF-LE.B.5

KEY: application | exponential function | compound interest NOT: Example 5

3. ANS: C PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.2

NAT: HSF-IF.C.7e | HSF-LE.B.5

KEY: simplifying natural base exponential expressions | natural base exponential expression | natural base e | properties of exponents NOT: Example 1

4. ANS: B PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.2

NAT: HSF-IF.C.7e | HSF-LE.B.5

KEY: simplifying natural base exponential expressions | natural base exponential expression | natural base e | properties of exponents NOT: Example 1

5. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.2

NAT: HSF-IF.C.7e

KEY: natural base exponential function | graphing natural base exponential functions | graph of an exponential function NOT: Example 2

6. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: rewriting exponential equations in logarithmic form

NOT: Example 2

7. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: rewriting exponential equations in logarithmic form

NOT: Example 2

8. ANS: C PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: evaluating logarithms | logarithmic expression

NOT: Example 3

9. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: evaluating logarithms | logarithmic expression

NOT: Example 3

10. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-BF.B.4a | HSF-LE.A.4

KEY: using inverse properties of logarithmic and exponential functions | simplifying logarithmic expressions NOT: Example 5

11. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-BF.B.4a | HSF-LE.A.4

KEY: using inverse properties of logarithmic and exponential functions | simplifying logarithmic expressions NOT: Example 5

12. ANS: C PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-BF.B.4a | HSF-LE.A.4 KEY: inverse functions | finding inverse functions

NOT: Example 6

13. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-BF.B.4a | HSF-LE.A.4 KEY: inverse functions | finding inverse functions

NOT: Example 6

14. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2 KEY: properties of logarithms | evaluating logarithms

NOT: Example 1

15. ANS: B PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2 KEY: properties of logarithms | evaluating logarithms

NOT: Example 1

16. ANS: C PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2

KEY: properties of logarithms | expanding logarithmic expressions

NOT: Example 2

17. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2

KEY: properties of logarithms | expanding logarithmic expressions

NOT: Example 2

18. ANS: B PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2

KEY: properties of logarithms | condensing logarithmic expressions

NOT: Example 3

19. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2

KEY: properties of logarithms | condensing logarithmic expressions

NOT: Example 3

20. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2 | HSF-LE.A.4 KEY: change-of-base formula | evaluating logarithms

NOT: Examples 4 and 5

21. ANS: D PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.5

NAT: HSA-SSE.A.2 | HSF-LE.A.4 KEY: application | logarithmic function

NOT: Example 6-1

22. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: exponential equations | solving exponential equations

NOT: Example 1

23. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: exponential equations | solving exponential equations

NOT: Example 1

24. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: logarithmic equations | solving logarithmic equations

NOT: Example 3

25. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: logarithmic equations | solving logarithmic equations

NOT: Example 3

26. ANS: B PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: logarithmic equations | solving logarithmic equations

NOT: Example 4

27. ANS: A PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: solving exponential inequalities | exponential inequality

NOT: Example 5

28. ANS: A PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: solving logarithmic inequalities | logarithmic inequality

NOT: Example 6

**NUMERIC RESPONSE**

1. ANS: 4

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: evaluating logarithms | logarithmic expression

NOT: Example 3

2. ANS: 0.903

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: evaluating logarithms | logarithmic expression

NOT: Example 4

3. ANS: 17

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.6

NAT: HSA-REI.A.1 | HSF-LE.A.4 KEY: application | exponential equations

NOT: Example 2-1

**SHORT ANSWER**

1. ANS:

exponential growth



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.1

NAT: HSF-IF.C.7e | HSF-IF.C.8b

KEY: exponential function | exponential growth function | graphing exponential growth functions | graph of an exponential function NOT: Example 1

2. ANS:

exponential growth



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.1

NAT: HSF-IF.C.7e | HSF-IF.C.8b

KEY: exponential function | exponential growth function | exponential decay function | graphing exponential growth and decay functions | graph of an exponential function NOT: Example 1

3. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HS F-LE.A.4 KEY: rewriting exponential equations in logarithmic form

NOT: Example 1

4. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HS F-LE.A.4 KEY: rewriting exponential equations in logarithmic form

NOT: Example 1

5. ANS:



PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 6.3

NAT: HSF-IF.C.7e

KEY: logarithmic function | graphing logarithmic functions | graph of a logarithmic function

NOT: Example 7

6. ANS:

about 107 dB

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.3

NAT: HSF-LE.A.4 KEY: evaluating logarithms | logarithmic expression

NOT: Application-1

**OTHER**

1. ANS:

a. exponential decay

b. 1% decrease

c. 2029

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 6.1

NAT: HSF-IF.C.8b | HSF-LE.A.2 | HSF-LE.B.5 KEY: application | exponential function

NOT: Example 2

2. ANS:

a. 12 yr

b. ; The inverse gives the number of deer present after time *t*.

PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 6.3

NAT: HSF-BF.B.4a | HSF-LE.A.4

KEY: inverse functions | finding inverse functions | evaluating logarithms

NOT: Application-2

3. ANS:

a. 

b. ; The inverse gives the amount of time it will take an initial investment of $4100 to reach the amount *A.*

c. no; *Sample answer*: It will take 8.7 years for the amount in the account to double, so about 1.7 more years are needed.

PTS: 1 DIF: Level 3 REF: Algebra 2 Sec. 6.3

NAT: HSF-BF.B.4a | HSF-LE.A.4 KEY: inverse functions | finding inverse functions

NOT: Application-3